

4822

# JOURNAL OF THE INSTITUTION OF CIVIL ENGINEERS



VOLUME 9. 1937-38

LONDON

Published by The Institution  
GREAT GEORGE STREET, S.W.1

*(The right of Publication and Translation is reserved)*

G20.6  
Ln8  
v.9

# JOURNAL OF THE INSTITUTION OF CIVIL ENGINEERS

Volume 9. 1937-38  
June and October, 1938

## CONTENTS

	Page
ORDINARY MEETING: 22 March, 1938 . . . . .	1
TRANSFERS AND ADMISSIONS . . . . .	1
“CONSTRUCTIONAL WORK OF THE FULHAM POWER-STATION.” *	
J. F. Hay . . . . .	3
“FULHAM BASE-LOAD POWER-STATION: MECHANICAL AND ELECTRICAL CONSIDERATIONS.” * W. C. Parker and Hubert Clarke . . . . .	17
ORDINARY MEETING: 29 March, 1938 . . . . .	95
“THE RECONSTRUCTION OF MAIN ROAD BRIDGES, CALCUTTA.” *	
M. R. Atkins and D. H. Remfry . . . . .	95
ORDINARY MEETING: 5 April, 1938 . . . . .	139
ELECTIONS . . . . .	139
“THE WORK OF THE PAINT RESEARCH LABORATORY OF THE LONDON, MIDLAND AND SCOTTISH RAILWAY COMPANY.” *	
Frank Fancutt . . . . .	140
ORDINARY MEETING: 26 April, 1938 . . . . .	183
“SOUTHAMPTON DOCKS EXTENSION.” * M. G. J. McHaffie . . . . .	184
EXTRA MEETING: 3 May, 1938 . . . . .	237
Presentation of the James Alfred Ewing Medal . . . . .	237
THE JAMES FORREST LECTURE, 1938, “Disorderly Molecules and Refrigerating Engineering.” Sir Frank Smith . . . . .	238
ORDINARY MEETING: 10 May, 1938 . . . . .	263
TRANSFERS, ADMISSIONS AND ELECTIONS . . . . .	263
ANNUAL GENERAL MEETING: 10 May, 1938 . . . . .	265
ELECTION OF THE COUNCIL FOR 1938-39 . . . . .	267
REPORT OF THE COUNCIL, 1937-38 . . . . .	270
Appendix: Balance Sheet and Accounts . . . . .	290
“THE FAILURE OF GIRDERS UNDER REPEATED STRESSES.” (Part 2.)	
Prof. F. C. Lea and J. G. Whitman . . . . .	301
“FLUID FLOW THROUGH NOZZLES, ORIFICES AND BORDA MOUTH- PIECES.” <i>The late</i> J. L. Hodgson and G. M. Clark . . . . .	329
ENGINEERING RESEARCH . . . . .	331
The Institution Research Committee . . . . .	331

---

\* Correspondence on these Papers appears in this Volume on pp. 533—568.



	Page
Joint Sub-Committee on Pile-Driving: Interim Report No. 1	331
Report of the Building Research Board for the Year 1937	345
Report of the National Physical Laboratory for the Year 1937	347
Report of the Water Pollution Research Board for the Year ending 30 June, 1937	348
Effect of Discharge of Crude Sewage into the Estuary of the River Mersey on the Amount and Hardness of the Deposit in the Estuary	350
Engineering Research in the Royal Naval College, Greenwich, May, 1938	350
Notes on Research Publications	353
THE VERNON-HARCOURT LECTURE, 1937-38 :—	
“ESTUARY CHANNELS AND EMBANKMENTS.” Brysson Cunning- ham	361
“A THEORY OF EARTH-PRESSURES AS APPLIED TO RETAINING WALLS.” S. B. Ahmed.	365
“MAIN ROAD DEVELOPMENT IN NEW SOUTH WALES.” H. M. Sherrard	371
“THE TUBE-WELL WATER-SUPPLIES OF ASSAM AND NORTH BENGAL.” H. A. C. P. Hetherington	373
CORRESPONDENCE ON PAPERS APPEARING IN VOLUMES 7, 8, AND 9 :—	
“A Pre-Cast Reinforced-Concrete Underline Railway-Bridge.” H. G. Follenfant	377
“Modern Swimming-Pool Design.” Edwin Lomax	378
“The Reduction of Carrying Capacity of Pipes with Age.” C. F. Colebrook and Asst. Prof. C. M. White.	381
“The Failure of Girders Under Repeated Stresses.” Prof. F. C. Lea and J. G. Whitman	400
“Combustion-Efficiencies of Gas and Oil Engines.” W. A. Tookey	401
“Dover Train-Ferry Dock.” George Ellson	405
“The Effect of the Form of Cross-Section on the Capacity and Cost of Trunk Sewers.” Thomas Donkin	410
“The Flow of Water in Short Channels.” C. F. J. Lisle	425
“The Reconstruction of Chelsea Bridge.” E. J. Buckton and H. J. Fereday	429
“Supplementary Notes on Flow Through Model Sluices.” Herbert Addison	447
“Shearing Stresses in Gravity Dams.” Serge Leliavsky	449
“The Subsidence of a Rockfill Dam and the Remedial Measures employed at Eildon Reservoir, Australia.” R. G. Knight	451
“An Experimental Investigation of the Effect of Bridge-Piers and other Obstructions on the Tidal Levels in an Estuary.” Prof. A. H. Gibson	495
“Some Experiments on Locomotive Springs, with Reference to Bridge Impact Allowances.” W. E. Gelson	501

# CONTENTS.

v  
Page

"The Galloway Hydro-Electric Development, with Special Reference to the Constructional Works." William Hudson and J. K. Hunter . . . . .	} 505
"The Galloway Hydro-Electric Development, with Special Reference to the Mechanical and Electrical Plant." William Hawthorne and F. H. Williams . . . . .	
"The Galloway Hydro-Electric Development, with Special Reference to its Interconnexion with the Grid." R. W. Mountain . . . . .	
"Engineering Problems Associated with Clay, with Special Reference to Clay Slips." T. H. Seaton . . . . .	523
"The Reconstruction of the Mocoretá and Timboy Bridges, Argentine North-Eastern Railway." G. C. Blofield . . . . .	528
"Rapid Staining in Granites used in Civil Engineering Work." B. H. Knight and Rena G. Knight . . . . .	530
"Constructional Work of the Fulham Power-Station." J. F. Hay . . . . .	} 533
"Fulham Base-Load Power-Station: Mechanical and Electrical Considerations." W. C. Parker and Hubert Clarke . . . . .	
"The Reconstruction of Main Road Bridges, Calcutta." M. R. Atkins and D. H. Remfry . . . . .	540
"The Work of the Paint Research Laboratory of the London, Midland and Scottish Railway Company." Frank Fancutt . . . . .	548
"Southampton Docks Extension." M. G. J. McHaffie . . . . .	553

ADDITIONAL ORIGINAL COMMUNICATIONS RECEIVED BETWEEN THE 1ST SEPTEMBER, 1937, AND THE 31ST AUGUST, 1938 . . . . .	569
--	-----

ENGINEERING RESEARCH . . . . .	571
Committee on the Deterioration of Structures in Sea-Water . . . . .	571
The Institution Research Committee . . . . .	571
Sub-Committee on Breathing Apparatus for Use in Sewers . . . . .	571
Sub-Committee on Reinforced-Concrete Structures for the Storage of Liquids . . . . .	572
Sub-Committee on Earthing to Metal Water-Pipes and Water-Mains Regulations . . . . .	572
Report of the Chemistry Research Board . . . . .	576
Report of the Forest Products Research Board . . . . .	577
Fifth Report of the Corrosion Committee of the Iron and Steel Institute . . . . .	578
Research Work in Engineering at Glasgow University . . . . .	579
Notes on Research Publications . . . . .	581

OBITUARY :	
Sir John Dewrance . . . . .	591
A. F. Stewart . . . . .	591

NAME- and SUBJECT-INDEXES FOR VOLUMES 7, 8, AND 9 . . . . .	593
---	-----

